

Bellwork: 2/19/13

Find the quadratic function that has roots of 3 and -9.

$$x = 3$$

$$x = -9$$

$$x - 3 = 0$$

$$x + 9 = 0$$

$$(x - 3)(x + 9)$$

$$x^2 + 9x - 3x - 27$$

$$y = x^2 + 6x - 27$$

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Section 5.2 - Finding a polynomial function given the roots.

To find a polynomial function when you are given the roots, convert the roots back to factors then FOIL out.

****Don't forget y = in answer!****

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example 1: $x = -2, 2, 3$

$$(x+2)(x-2)(x-3)$$

$$(x^2 - \cancel{2x} + \cancel{2x} - 4)(x-3)$$

$$(x^2 - 4)(x-3)$$

$$y = x^3 - 3x^2 - 4x + 12$$

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example 2: $x = 0, 3, 4$

$$y = (x+0)(x-3)(x-4)$$

$$y = x(x-3)(x-4)$$

$$y = (x^2 - 3x)(x-4)$$

$$y = x^3 - \underline{4x^2} - 3x^2 + 12x$$

$$y = x^3 - 7x^2 + 12x$$

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example 3: $x = 0, 0, 2, -5$

$$(x+0)(x+0)(x-2)(x+5)$$

$$x^2(x-2)(x+5)$$

$$x^2(x^2 + 5x - 2x - 10)$$

$$x^2(x^2 + 3x - 10)$$

$$y = x^4 + 3x^3 - 10x^2$$

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example 4: $x = -2, -2, 2, 3$

$$(x+2)(x+2)(x-2)(x-3)$$

$$(x^2 + 4x + 4)(x^2 - 5x + 6)$$

$$\cancel{x^4 + 4x^3 + 4x^2 - 5x^3 - 20x^2 - 20x + 6x^2 + 24x + 24}$$

$$y = x^4 - x^3 - 10x^2 + 4x + 24$$

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